



Title: LINAC PCB Capacitor Replacement

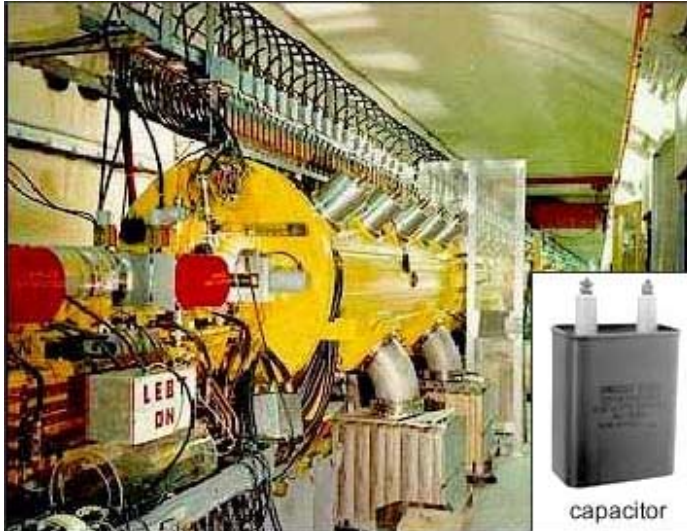


Figure 1 BNL Linear Accelerator tunnel and capacitor.

Benefits at a glance:

- Greatly reduces the potential for release of PCBs and associated clean-up wastes
- Improves LINAC reliability
- Reduces machine maintenance overhead

Description:

The C-A Department's 200 MeV linear accelerator (LINAC) contains 2,984 PCB-bearing capacitors containing over 1500 gallons of oil. These capacitors are all original equipment to the LINAC and are all in excess of 30 years old. The capacitors were custom made to BNL specifications, which called for a minimum 40,000 hour operating life. A conservative estimate of the operational hours presently logged to these capacitors is 180,000 hours. Although the failure rates have been low, serious consideration should be given to a program to replace these aging devices. A significant amount of hazardous waste is generated each time a PCB spill is cleaned up.

The immediate benefit from such a program would be to greatly reduce the potential for failures and release of PCB contaminated oils to the environment, improve accelerator reliability and reduce the maintenance overhead. The management and inspection of this inventory presently requires over 10 man-weeks per year. The Los Alamos Neutron Science Center Linear Accelerator, built during the same period as the BNL LINAC, operating similar capacitor circuits, has recently experienced several failures of its high power capacitors, including two explosions during operation.

This proposal seeks funding for the replacement of 100 capacitors in the Driver Amp capacitor bank, one of several systems at the LINAC in need of replacement.

Project Title: LINAC PCB Capacitor Replacement

Project Features:

Host Site Brookhaven National Laboratory
Host PSO Program Secretarial Office is Department of Science, SC
Dept/Div Plant Engineering
Point of Contact V. LoDestro, x5005, lodestr1@bnl.gov
Benefits Greatly reduces the potential for release of PCBs and generation of associated clean-up wastes

Project Type	Source Reduction, Waste Minimization
Primary Wastes Avoided	Hazardous waste (PCB)
Projected Annual Waste Reduction	Volume of PCB spill clean up wastes generated on an incident-by-incident basis.
Projected Useful Life	Lifetime of capacitor operation (> 10 years)
Requested Capital Funds	\$ 67,300 (Driver Amp Capacitor Bank, 100 capacitors total).
Requested Expense Funds	None. Installation can be performed by BNL staff.
TOTAL PROJECT COST	\$ 67,300
Projected Annual Savings	Dependent upon number of PCB spill incidents and associated clean up costs avoided per year.
PAYBACK PERIOD	Dependent upon random annual spill incidents which cannot be precisely calculated.
Non-financial Benefits	Greatly reduces the potential for release of PCBs and associated clean-up wastes, improves accelerator reliability, eliminates/reduces approximate 10 man-week annual capacitor inspection effort.
Regulatory Drivers	TSCA
Critical Outcomes	C1. Reduce Hazardous, Mixed, and Low-Level Radioactive Routine Waste Streams. C2. Evaluate and Implement Pollution Prevention Measures. C3. Eliminate Significant Spills
Implementation Schedule	Work could easily be performed within the fiscal yaer.

Potential for Broader Application:

Any facility which uses PCB-filled equipment could benefit from this type of replacement program.